Trend Study 24-6-03

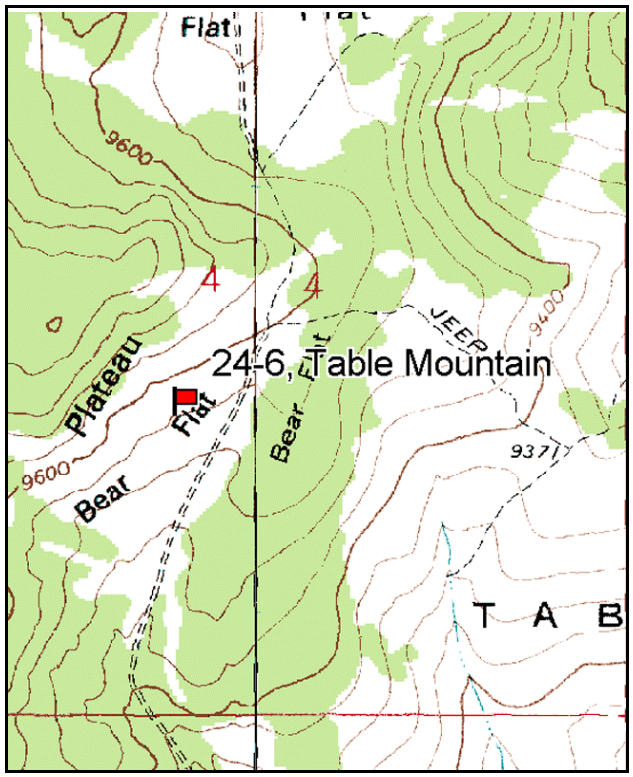
Study site name: Table Mountain . Vegetation type: Burn .

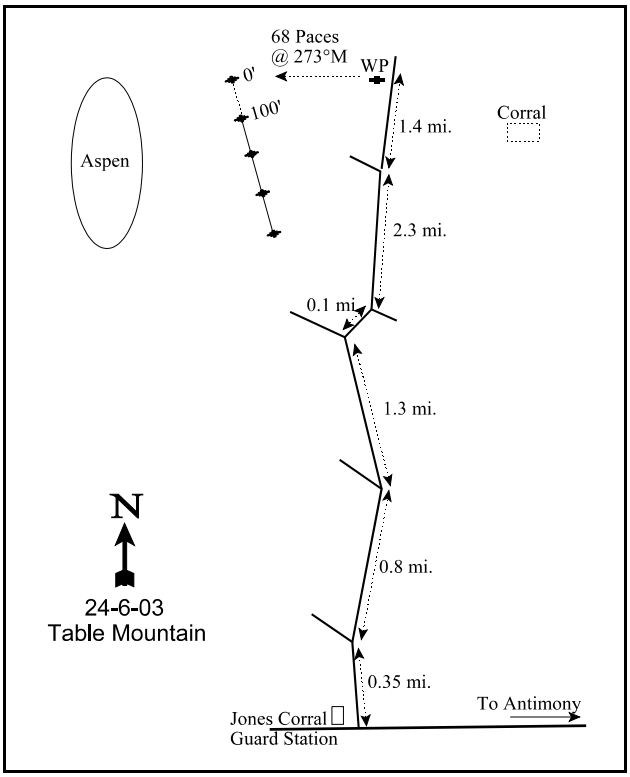
Compass bearing: frequency baseline 163 degrees magnetic.

Frequency belt placement: line 1 (11 & 95ft), line 2 (34ft), line 3 (59ft), line 4 (71ft).

LOCATION DESCRIPTION

From the Jones Corral Guard Station, head north towards Table Mountain. Go 0.35 miles to a fork, stay right and continue 0.8 miles to another fork. Stay right and continue 1.3 miles to a fork and cattleguard. Keep right and go 0.1 miles to another fork. Bear left and continue 2.3 miles to a fork. Stay right and continue north for 1.4 miles to a burned flat surrounded by aspens. Look for a 4ft tall witness post on the left side of the road. From the witness post walk 68 paces at 273 degrees magnetic to the 0'stake. The 0-foot baseline stake is marked by a red browse tag #9004.





Map Name: Junction

Diagrammatic Sketch

Township 31S , Range 2 1/2W , Section 4

GPS: NAD 27, UTM 12S 4221465 N, 401221 E

DISCUSSION

Table Mountain - Trend Study 24-6

This trend study is located on a prescribed burn on Table Mountain at an elevation of 9,500 feet. The terrain slopes gradually to the southeast with a slope of 7%. This is a key area for elk and deer during the summer. The site once supported an extensive stand of mountain big sagebrush which is reestablishing itself on the site. A variety of grasses now dominate and provide good ground cover. Adjacent stands of aspen provide escape cover for big game that use this area. Pellet group data from 1997 estimated 53 deer, 61 elk, and 10 cow use days/acre (131 ddu/ha, 151 edu/ha, and 25 cdu/ha). This is a sheep allotment which is grazed from July 1st to September 30th. This unit was in non-use status for a time. Pellet group data from 2003 estimated light big game use at 16 deer and 3 elk days use/acre (40 ddu/ha and 7 edu/ha). Cattle use, which appears to have occurred during the summer of 2002, was estimated at 13 days use/acre (32 cdu/ha). Sheep were in the area during the 2003 reading on August 7th and had heavily utilized the site. Sheep use was estimated at 84 days use/acre (207 sdu/ha).

The soils are deep, rocky, and derived from volcanic parent material. The soil is well drained and not compacted with an effective rooting depth estimated at almost 15 inches. It has a loam texture and is moderately acidic in reaction (pH 6.1). The vegetation is continuous and intact, leaving little bare ground unprotected. Erosion is not a problem on the site.

Oregon grape and snowberry sprouted after the fire and they dominated the browse composition in 1987 and 1991. Mountain big sagebrush was sparsely distributed over the burn, at a density of only 33 plants/acre in 1987 and 66 in 1991. The much larger sample used in 1997 estimated 1,620 sagebrush plants/acre, 62% of which were young plants. Density of mountain big sagebrush increased slightly in 2003 to 1,760 plants/acre. Average cover doubled since 1997 from 3% to 6% and mature plants are large and vigorous averaging 27 inches in 2003. At this elevation, sagebrush is not highly preferred and use was mostly light in 1997 and 2003.

Snowberry appears to have stabilized at around 1,500 plants/acre. Average cover has remained similar at 6% in 1997 and 5% in 2003. Utilization of snowberry has been moderate to heavy during most years likely due to sheep use. Vigor has remained good and decadence low. Other shrubs found on the site include small numbers of currant and Woods rose.

The herbaceous understory dominates the site with 13 grass species providing 21% cover in 1997 and 20 species of forbs producing an additional 16% cover. The most abundant grass is Letterman needlegrass which provided nearly half (48%) of the grass cover in 1997 and 74% in 2003. Bluebunch wheatgrass, mutton bluegrass, and needle-and-thread are also common. The forb composition is dominated by silvery lupine which produced 53% of the forb cover in 1997 and 76% in 2003. The only other abundant forbs include a phlox and dandelion. Some misidentification between the *Poa* species (*Poa fendleriana, Poa pratensis* and *Poa secunda*) appears to have occurred in 1987 causing large changes in nested and quadrat frequencies. In addition, identification problems in 2003 due to heavy sheep use may have underestimated mutton bluegrass and overestimated Letterman needlegrass.

1991 TREND ASSESSMENT

Vegetative basal cover has increased to almost 14% with bare ground going down to about 9%. Percent rock decreased slightly and percent litter increased slightly. Soil trend is improving. For the browse, normally the key species would be mountain big sagebrush, but with only 66 plants/acre it cannot be counted on very much. Snowberry on this site is heavily used. It's density has decreased by 5% with a slight increase in percent decadency. Trend is improving but still poor since the prescribed burn. The trend for the herbaceous

understory is, for the most part improving. However, most of the species for both grasses and forbs are increaser's in habit, which is not an ideal situation. Other species would be more preferred.

TREND ASSESSMENT
soil - slightly upward (4)
browse - slightly upward (4)
herbaceous understory - slightly upward (4)

1997 TREND ASSESSMENT

Trend for soil is stable with excellent protective ground cover. Trend for browse is up for mountain big sagebrush with a 96% increase in density. Reproductive potential and the proportion of young plants in the population have both increased dramatically since 1991. Utilization is mostly light, vigor good with few decadent plants. However, sagebrush is not a key component of summer range. Snowberry has declined in density by 53%, however this appears to be due more to the larger sample size used in 1997 which better estimates shrub densities. The snowberry appears to have a stable, lightly utilized population. Trend for the herbaceous understory is stable even though there was a decline in the sum of nested frequency for both grasses and forbs. Looking at the photo point comparisons between years, it appears that the decline in nested frequency of herbaceous species is a natural thinning process after a flush of growth following the burn. Grasses and forbs are very abundant and produce 37% cover on the site and browse cover, for all species, is only 9%.

TREND ASSESSMENT
soil - stable (3)
browse - up (5)
herbaceous understory - stable (3)

2003 TREND ASSESSMENT

Trend for soil is down. There is still enough protective ground cover to prevent most erosion but vegetation cover declined by 20% and litter cover declined by 52%. Cover of bare ground is still fairly low but it increased from 6% to 15% since 1997. Trend for browse is stable but shrubs are not the most important aspect considering this site is summer range. The fire eliminated most of the shrubs on the site prior to the 1987 reading, but shrubs have come back and currently provide 30% of the total vegetative cover. Mountain big sagebrush accounts for 54% of the total browse cover with a density of 1,760 plants/acre. However, at this elevation, it is mostly unutilized. Density of snowberry has increased slightly since 1997. It was heavily utilized by sheep. The key component of the site is the herbaceous understory which is diverse and productive but the composition could be better. Thirteen species of perennial grasses were encountered on the site in 1997 and 9 species were sampled in 2003. Sum of nested frequency of perennial grasses declined 30% since 1997. The most abundant grass is Letterman needlegrass which accounted for 74% of the grass cover in 2003. Other common grasses include needle-and-thread, mutton bluegrass, and bluebunch wheatgrass. Nested frequency of bluebunch wheatgrass and mutton bluegrass declined significantly. Significant drops in nested frequency were also seen in thickspike wheatgrass, Carex, sheep fescue, and bottlebrush squirreltail. Some of the changes in cover and frequency of mutton bluegrass and Letterman needlegrass may be due to difficulty identifying these grasses due to heavy sheep use. The forb composition is also diverse but only a few species, silvery lupine, phlox, and dandelion, are common. Sum of nested frequency of perennial forbs has declined 42% since 1997. Average cover of forbs also declined from 16% in 1997 to 10% in 2003. The herbaceous trend is considered down.

TREND ASSESSMENT
soil - down (1)
browse - stable (3)
herbaceous understory - down (1)

HERBACEOUS TRENDS --
Management unit 24 , Study no: 6

Type	Species	Nested Frequency				Average Cover %	
		'87	'91	'97	'03	'97	'03
G	Agropyron dasystachyum	$_{c}$57	$_{b}$11	$_{b}$13	$_{a}$-	.15	-
G	Agropyron spicatum	$_{a}$39	$_{b}$79	$_{b}$103	$_{a}$6	3.33	.18
G	Agropyron trachycaulum	$_{b}$64	$_{b}$52	$_{a}$3	$_{a}$4	.03	.03
G	Bromus anomalus	$_{bc}$14	$_{c}$29	$_{ab}$3	$_{a}$-	.02	-
G	Carex spp.	$_{b}$17	$_{b}$26	$_{b}$33	$_{a}$-	.56	-
G	Festuca ovina	$_{c}$155	$_{b}$8	$_{b}$17	$_{a}$-	.22	-
G	Koeleria cristata	$_{a}$5	$_{b}$112	$_{a}$27	$_{a}$17	.24	.07
G	Poa fendleriana	$_{ab}$60	$_{c}$148	$_{b}$86	$_{a}$41	1.69	.62
G	Poa pratensis	$_{a}$7	$_{b}$91	$_{a}$4	$_{a}$10	.06	.18
G	Poa secunda	$_{b}$146	$_{a}$8	$_{a}$-	$_{a}$5	-	.18
G	Sitanion hystrix	$_{b}$55	$_{b}$54	$_{b}$46	$_{a}$-	.95	-
G	Stipa columbiana	$_{a}$-	$_{a}$-	$_{b}$15	$_{b}$24	.78	.71
G	Stipa comata	$_{a}$5	$_{b}$77	$_{b}$91	$_{b}$91	2.86	2.82
G	Stipa lettermani	$_{a}$163	$_{b}$266	$_{a}$178	$_{b}$242	9.94	13.35
Total for Annual Grasses		0	0	0	0	0	0
Total for Perennial Grasses		787	961	619	440	20.88	18.16
Total for Grasses		787	961	619	440	20.88	18.16
F	Achillea millefolium	$_{b}$7	$_{ab}$6	$_{ab}$3	$_{a}$-	.03	.00
F	Agoseris glauca	$_{a}$-	$_{a}$1	$_{b}$39	$_{a}$-	.09	-
F	Antennaria rosea	2	3	-	-	-	-
F	Arabis pulchra	$_{b}$166	$_{a}$1	$_{a}$1	$_{a}$1	.00	.00
F	Astragalus convallarius	$_{a}$-	$_{c}$48	$_{b}$23	$_{a}$1	.21	.03
F	Aster spp.	-	-	-	1	-	.00
F	Astragalus spp.	-	-	1	-	.00	-
F	Calochortus nuttallii	-	-	4	-	.01	-
F	Chenopodium album (a)	-	-	14	15	.04	.09
F	Crepis acuminata	-	-	5	-	.06	-
F	Erigeron eatonii	$_{a}$-	$_{b}$15	$_{a}$6	$_{ab}$6	.03	.01
F	Eriogonum flavum	-	6	-	-	-	-
F	Eriogonum racemosum	5	10	13	4	.11	.01

Type	Species	Nested Frequency				Average Cover %	
		'87	'91	'97	'03	'97	'03
F	Lupinus argenteus	97	95	105	79	8.69	7.74
F	Lychnis drummondii	$_{a}$-	$_{b}$86	$_{a}$-	$_{a}$-	-	-
F	Lygodesmia spinosa	-	-	4	-	.01	-
F	Penstemon spp.	$_{b}$107	$_{a}$21	$_{a}$7	$_{a}$8	.06	.02
F	Phlox pulvinata	$_{b}$145	$_{b}$156	$_{a}$65	$_{a}$47	4.34	.48
F	Potentilla concinna	6	3	6	4	.06	.06
F	Potentilla diversifolia	$_{a}$-	$_{a}$4	$_{b}$12	$_{a}$-	.06	-
F	Senecio multilobatus	$_{ab}$8	$_{a}$-	$_{b}$16	$_{a}$-	.06	-
F	Taraxacum officinale	$_{c}$303	$_{b}$228	$_{a}$139	$_{a}$115	2.26	1.68
F	Thermopsis montana	-	-	2	-	.03	-
F	Tragopogon dubius	6	6	9	1	.07	.03
F	Unknown forb-perennial	7	-	-	-	-	-
Total for Annual Forbs		0	0	14	15	0.04	0.09
Total for Perennial Forbs		859	689	460	267	16.23	10.09
Total for Forbs		859	689	474	282	16.27	10.18

Values with different subscript letters are significantly different at alpha = 0.10

BROWSE TRENDS --
Management unit 24 , Study no: 6

Type	Species	Strip Frequency		Average Cover %	
		'97	'03	'97	'03
B	Artemisia tridentata vaseyana	38	44	3.08	6.41
B	Chrysothamnus viscidiflorus viscidiflorus	1	0	-	-
B	Mahonia repens	11	12	.34	.34
B	Ribes cereum inebrians	2	2	.15	.03
B	Rosa woodsii	2	2	.03	.03
B	Symphoricarpos oreophilus	43	47	5.71	5.15
Total for Browse		97	107	9.31	11.98

CANOPY COVER, LINE INTERCEPT --
Management unit 24 , Study no: 6

Species	Percent Cover '03
Artemisia tridentata vaseyana	10.13
Mahonia repens	.08
Ribes cereum inebrians	.38
Rosa woodsii	.01
Symphoricarpos oreophilus	5.48

KEY BROWSE ANNUAL LEADER GROWTH --
Management unit 24 , Study no: 6

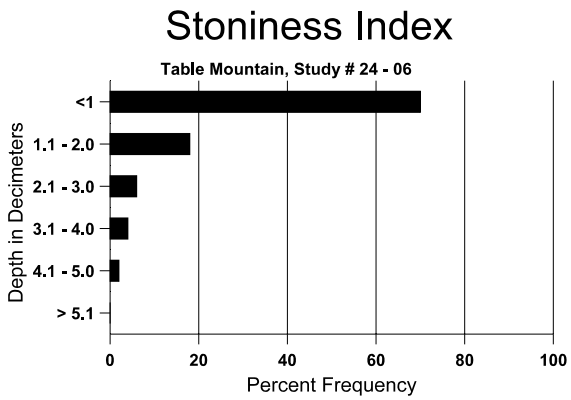
Species	Average leader growth (in) '03
Artemisia tridentata vaseyana	2.2

BASIC COVER --
Management unit 24 , Study no: 6

Cover Type	Average Cover %			
	'87	'91	'97	'03
Vegetation	11.75	13.50	52.29	42.05
Rock	7.75	6.25	7.28	23.31
Pavement	19.75	19.75	10.85	9.54
Litter	48.50	52.00	33.23	15.77
Cryptogams	0	0	.39	0
Bare Ground	12.25	8.50	5.76	14.65

SOIL ANALYSIS DATA --
Management unit 24, Study no: 6, Study Name: Table Mountain

Effective rooting depth (in)	Temp °F (depth)	pH	%sand	%silt	%clay	%0M	PPM P	PPM K	dS/m
14.8	58.3 (12.5)	6.1	38.4	35.1	26.6	5.0	47.1	454.4	0.6



PELLET GROUP DATA --
Management unit 24 , Study no: 6

Type	Quadrat Frequency '97	Quadrat Frequency '03	Days use per acre (ha) "97	Days use per acre (ha) '03
Sheep	-	24	-	84 (206)
Rabbit	4	-	-	-
Elk	15	8	61 (151)	3 (7)
Deer	18	2	53 (131)	16 (40)
Cattle	2	4	10 (25)	13 (32)

BROWSE CHARACTERISTICS --
Management unit 24 , Study no: 6

		Age class distribution (plants per acre)					Utilization				
Year	Plants per Acre (excluding seedlings)	Seedling	Young	Mature	Decadent	Dead	% moderate	% heavy	% decadent	% poor vigor	Average Height Crown (in)
Artemisia tridentata vaseyana											
87	**33**	33	33	-	-	-	100	0	0	0	-/-
91	**66**	66	33	33	-	-	50	0	0	0	10/14
97	**1620**	760	1000	620	-	300	6	0	0	0	22/38
03	**1760**	60	300	1400	60	80	3	0	3	1	27/37
Chrysothamnus viscidiflorus viscidiflorus											
87	**33**	-	-	-	33	-	0	100	100	100	-/-
91	**66**	-	-	66	-	-	0	100	0	0	6/6
97	**20**	-	-	20	-	-	0	0	0	0	13/14
03	**0**	-	-	-	-	-	0	0	0	0	16/35

		Age class distribution (plants per acre)					Utilization				
Year	Plants per Acre (excluding seedlings)	Seedling	Young	Mature	Decadent	Dead	% moderate	% heavy	% decadent	% poor vigor	Average Height Crown (in)
Mahonia repens											
87	**7066**	1700	2700	4366	-	-	.94	0	0	0	4/4
91	**12198**	133	4766	7366	66	-	3	1	1	0	3/3
97	**1940**	-	100	1840	-	-	0	0	0	0	4/6
03	**1840**	-	-	1840	-	-	0	0	0	0	2/4
Pseudotsuga menziesii											
87	**0**	-	-	-	-	-	0	0	-	0	-/-
91	**0**	-	-	-	-	-	0	0	-	0	-/-
97	**0**	-	-	-	-	20	0	0	-	0	-/-
03	**0**	-	-	-	-	-	0	0	-	0	-/-
Ribes cereum inebrians											
87	**0**	-	-	-	-	-	0	0	-	0	-/-
91	**66**	-	-	66	-	-	50	0	-	0	18/19
97	**40**	-	-	40	-	-	0	0	-	0	42/55
03	**40**	-	-	40	-	-	50	0	-	0	55/69
Rosa woodsii											
87	**0**	-	-	-	-	-	0	0	0	0	-/-
91	**0**	-	-	-	-	-	0	0	0	0	-/-
97	**220**	-	100	120	-	-	0	0	0	0	8/9
03	**160**	-	40	100	20	-	75	0	13	13	11/9
Symphoricarpos oreophilus											
87	**2833**	266	1300	1533	-	-	5	95	0	16	18/20
91	**2699**	-	633	1800	266	-	56	20	10	4	14/24
97	**1260**	40	120	1000	140	20	14	5	11	3	17/36
03	**1740**	-	140	1540	60	20	38	43	3	1	19/37